

# Master in Artificial Intelligence



## Algorithm Selection & Development VII







# Purpose

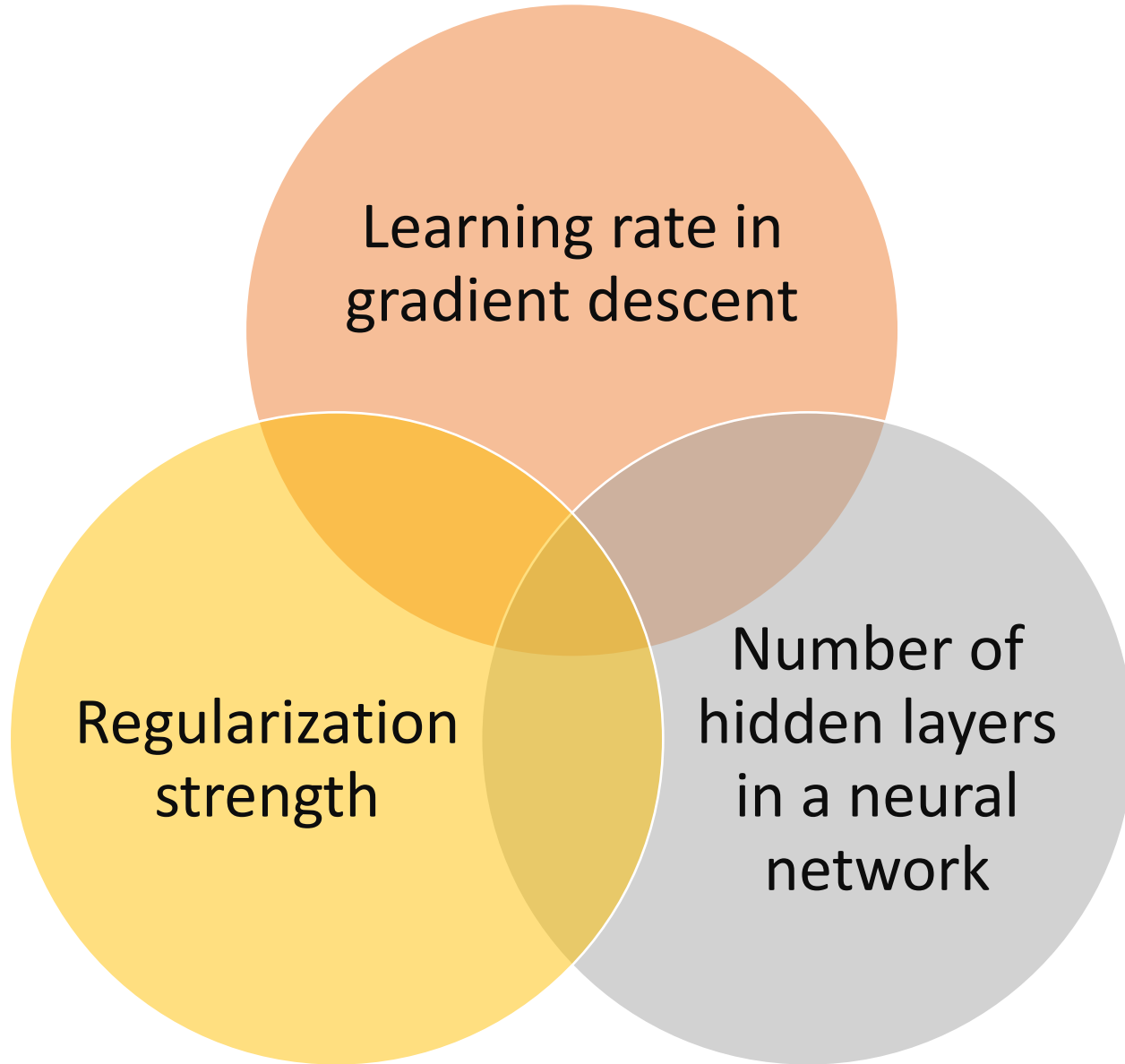
**The purpose of the section is to help you learn how to research, select, and develop appropriate algorithms to become a Successful Artificial Intelligence (AI) Engineer**

**At the end of this lecture, you will learn the following**

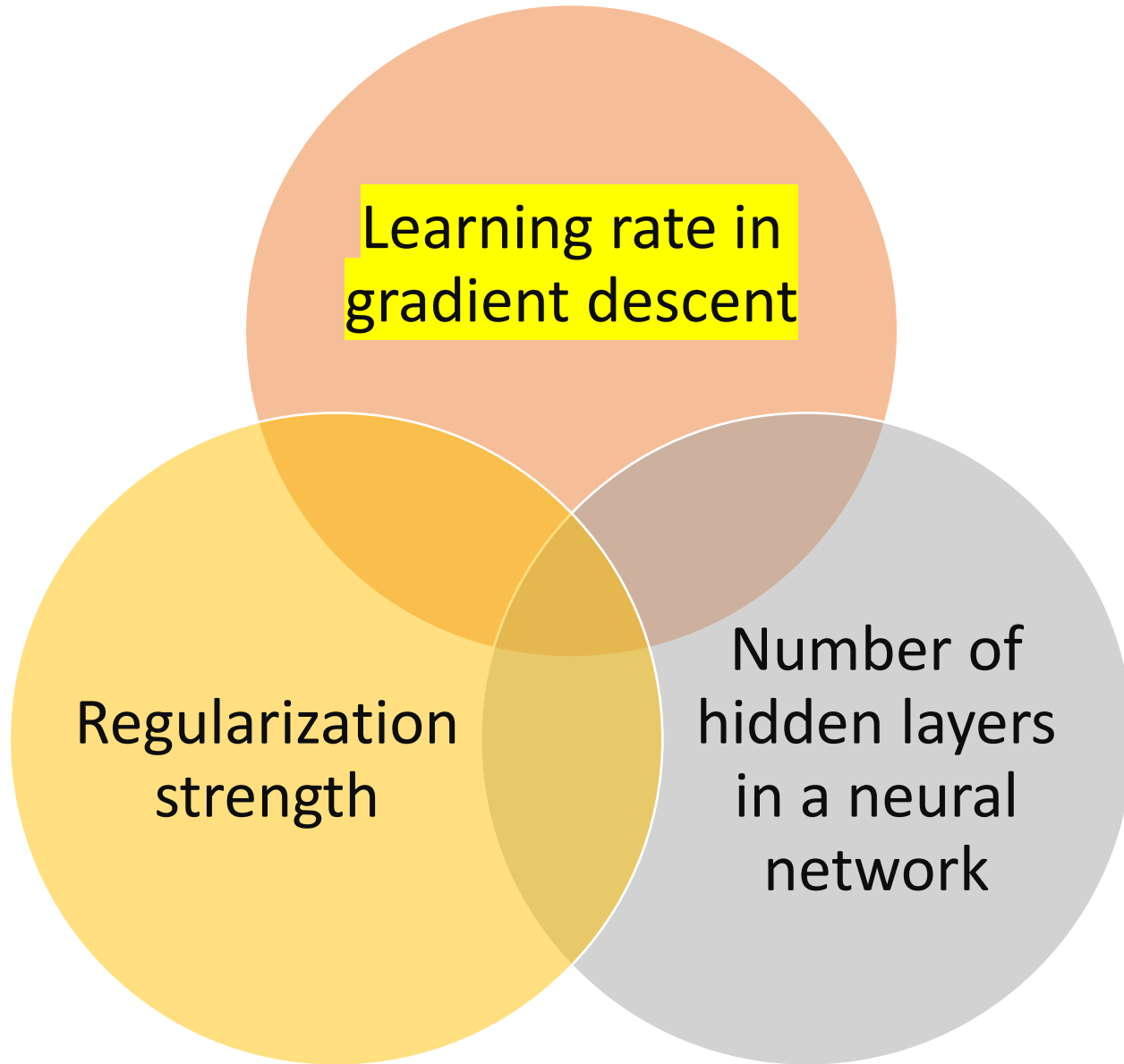
- **Learning rate in gradient descent hyperparamete**



# Hyperparameter tuning

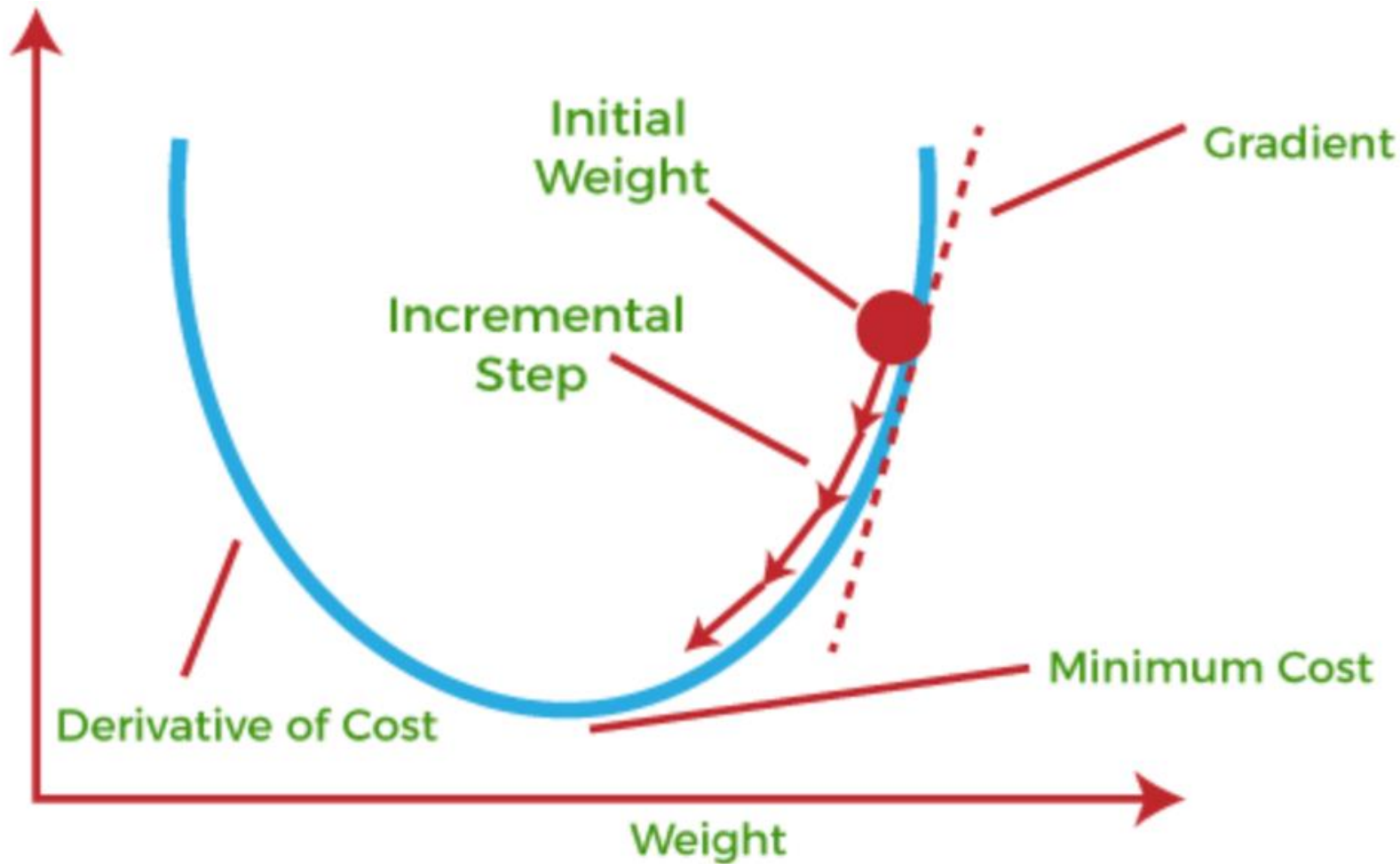


# What is learning rate in gradient descent?

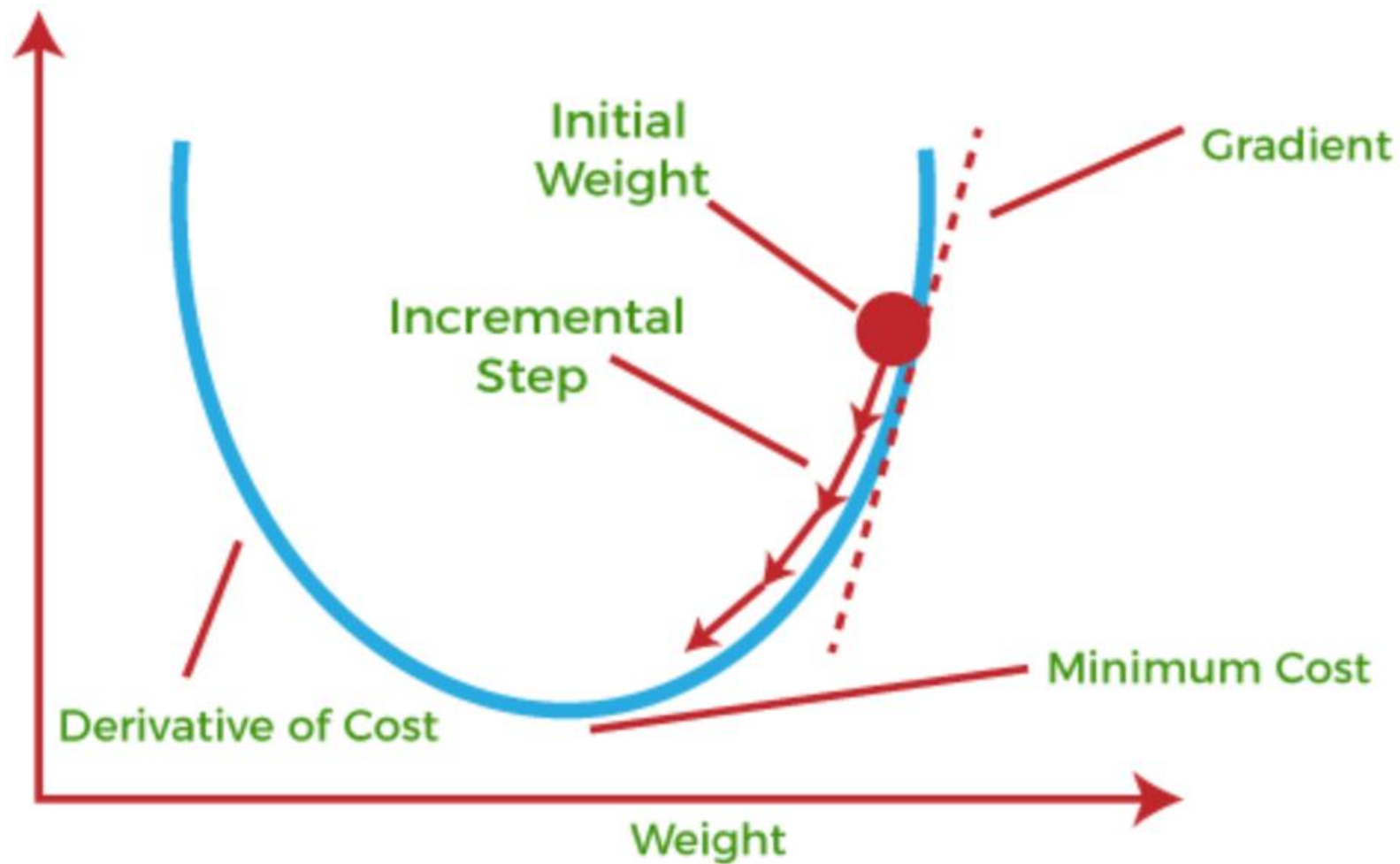


# Learning rate in gradient descent

The learning rate determines the step size taken during the gradient descent optimization process.

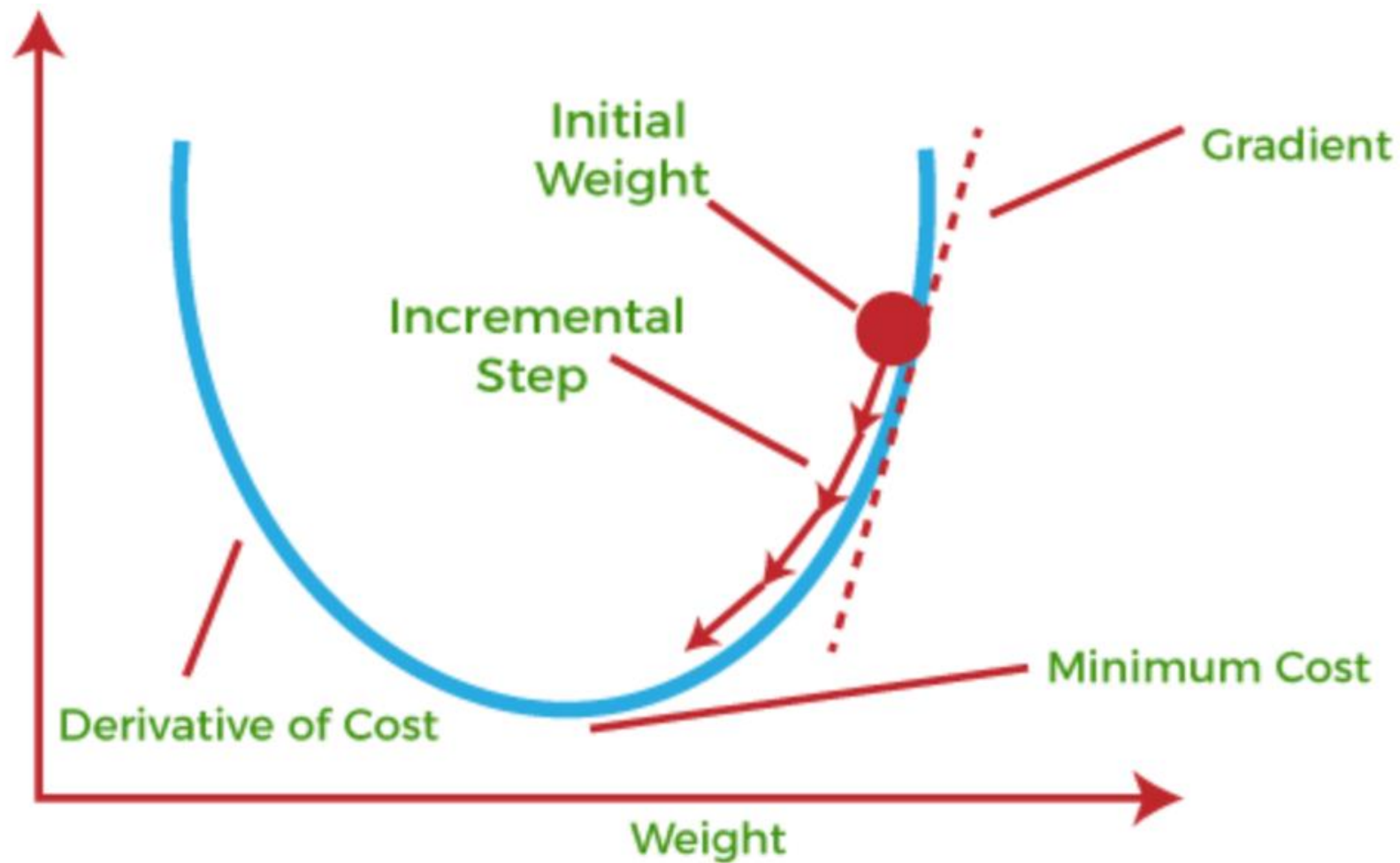


# What is gradient descent optimization process?



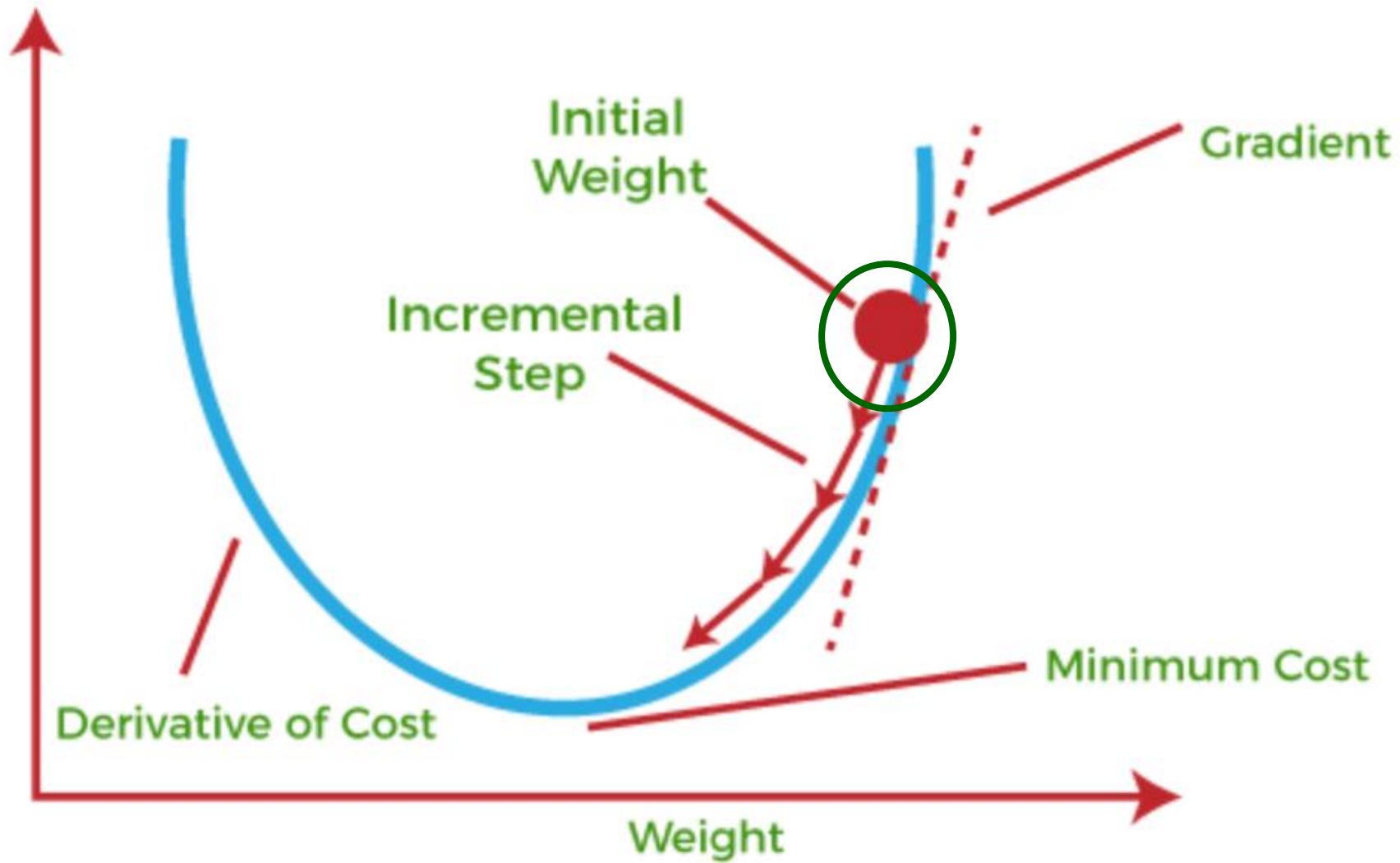


# What is gradient descent optimization process?

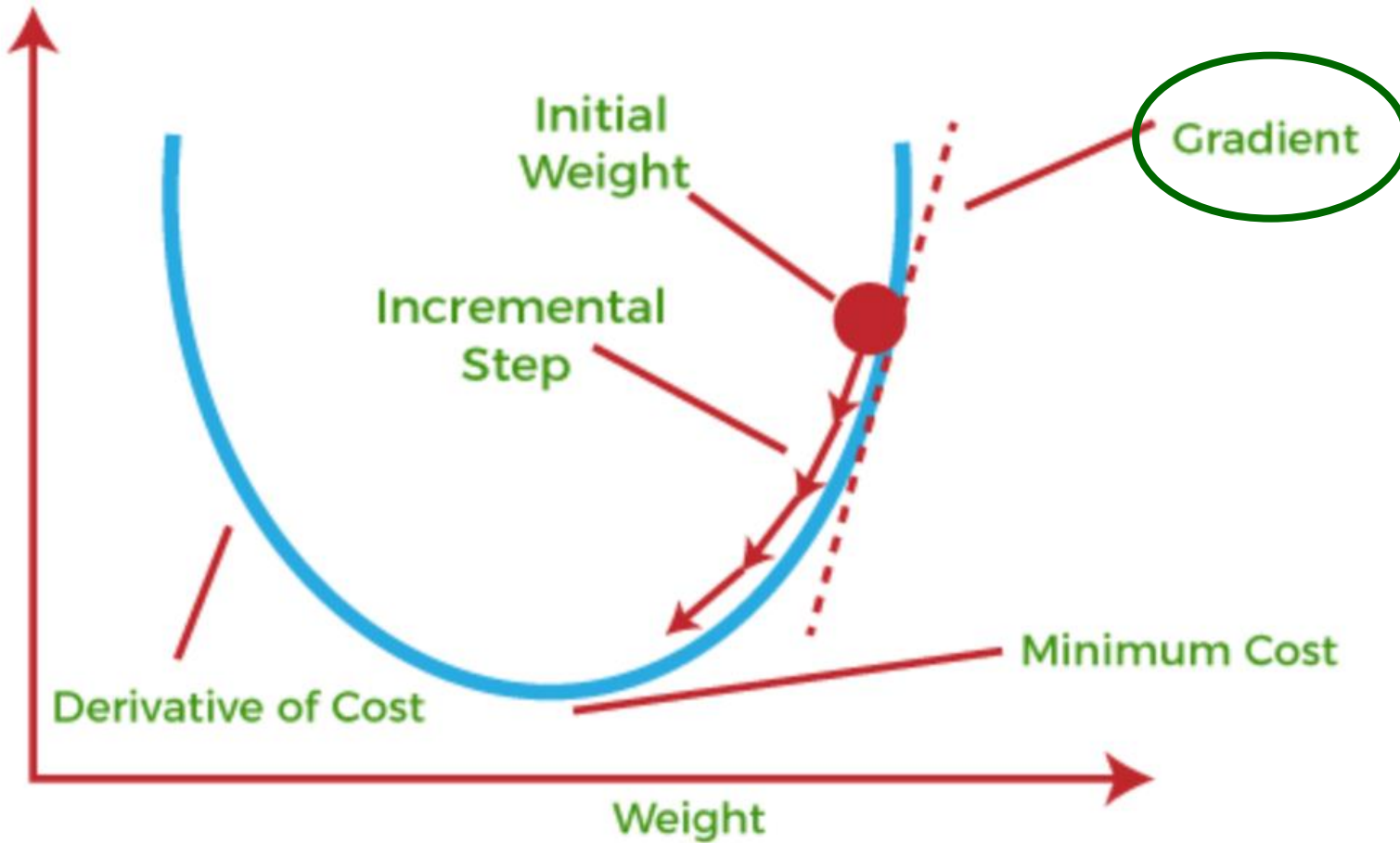




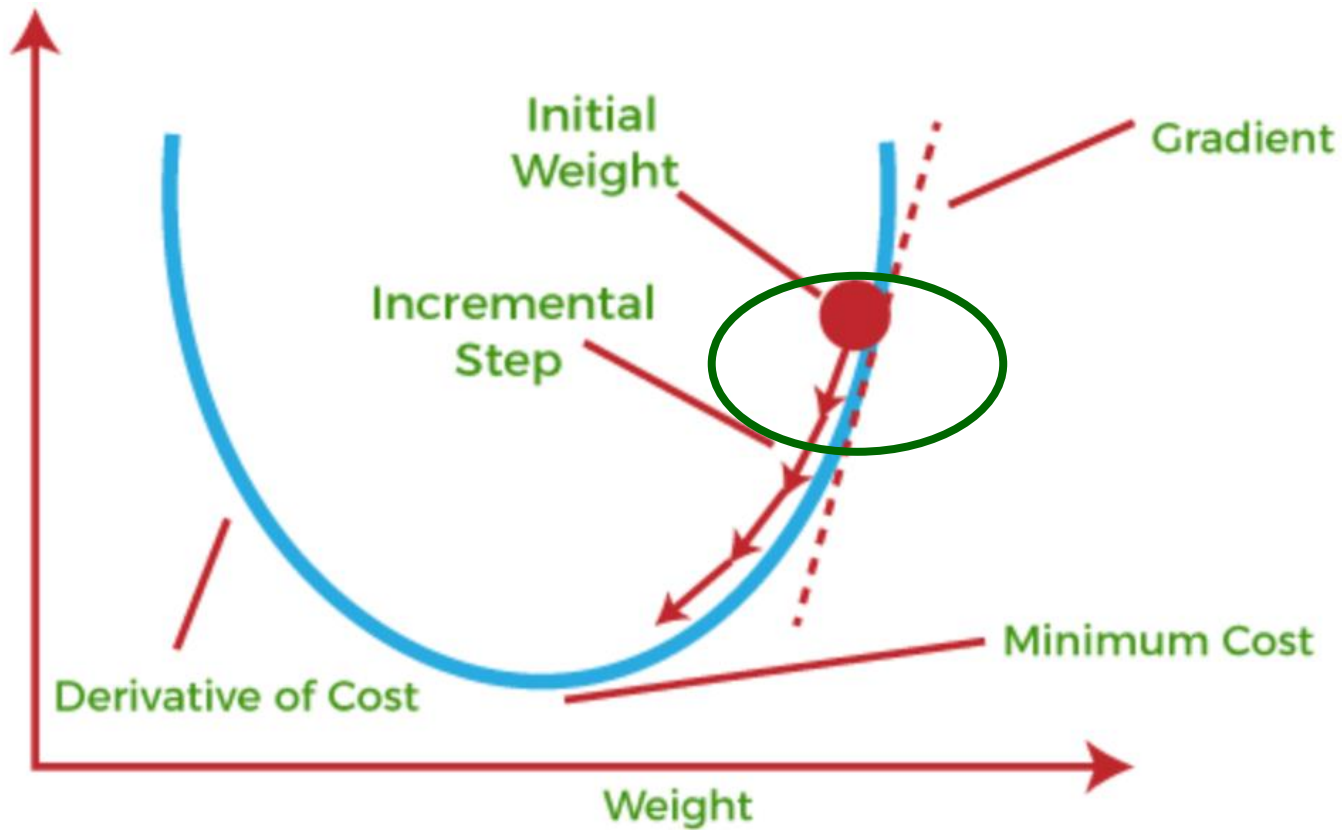
# Initialization



# Compute Gradient

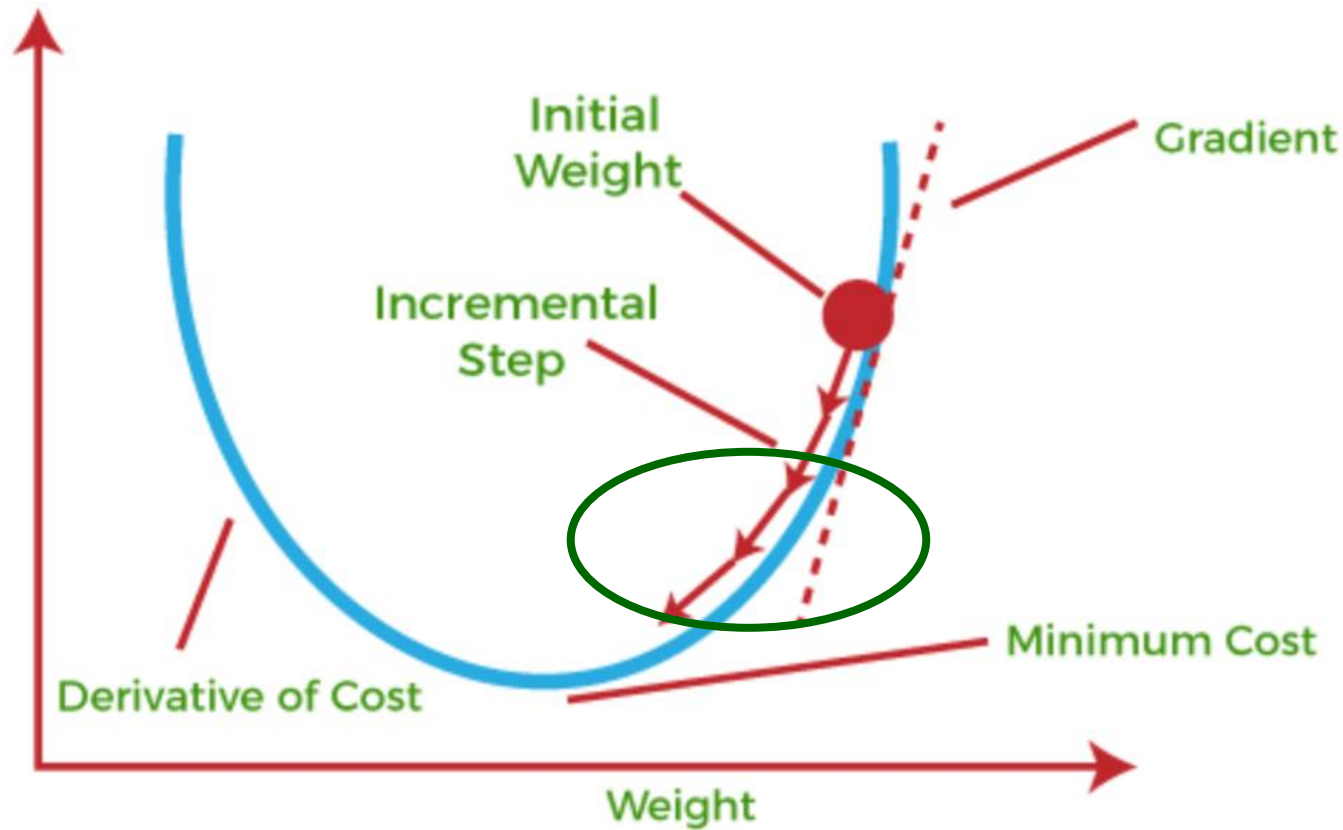


# Update Parameter

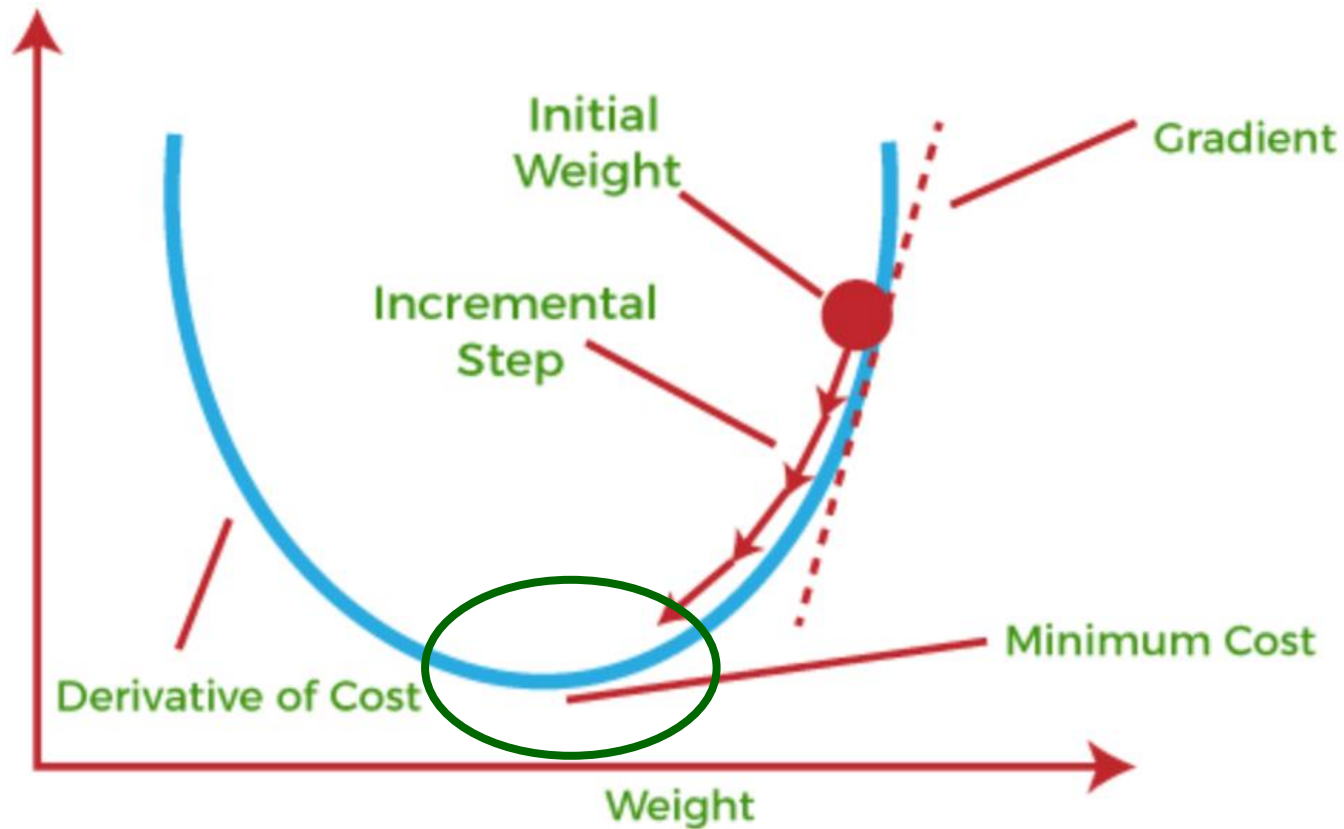




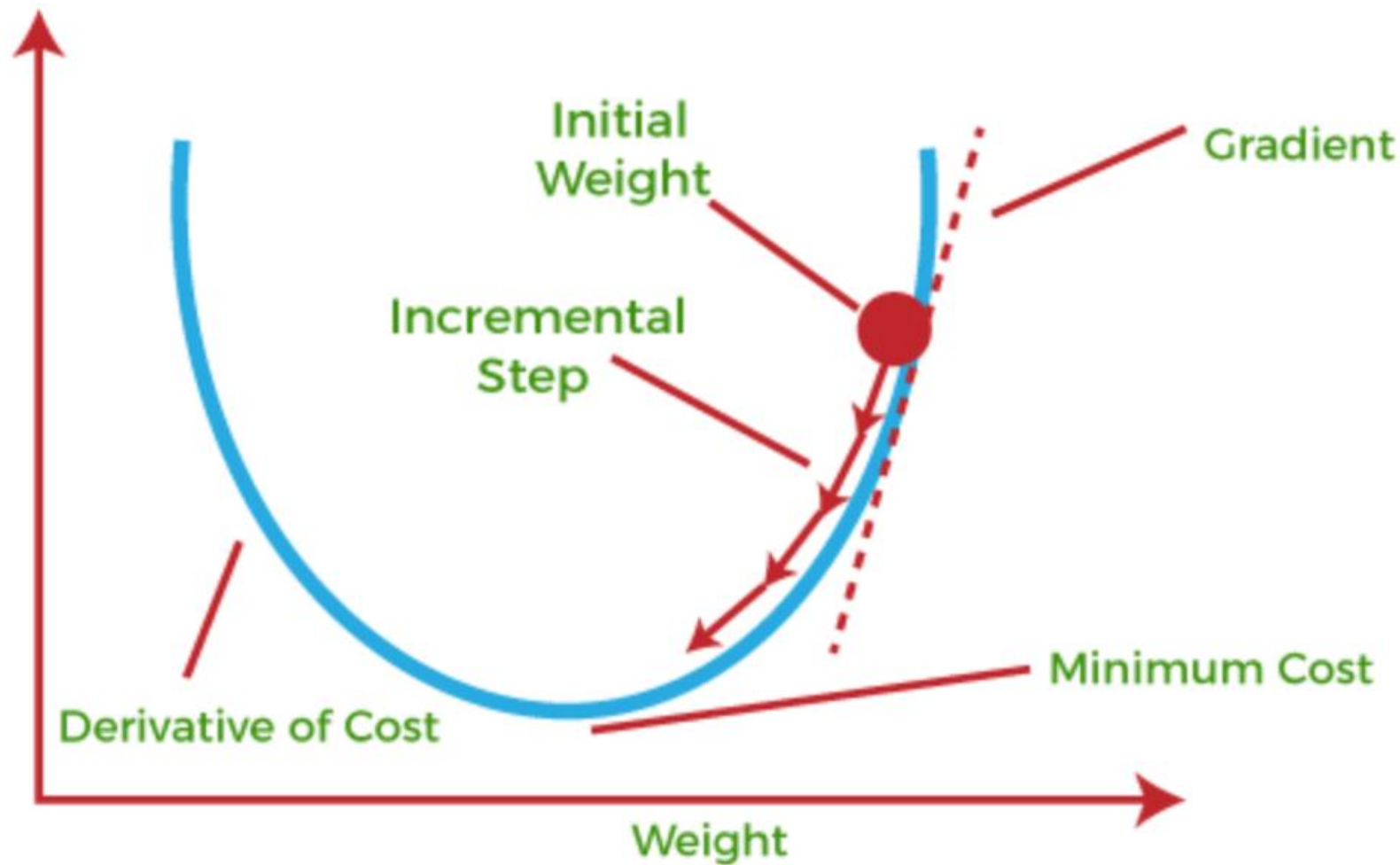
# Iterate



# Convergence



# What is gradient descent optimization process?





# Learning rate in gradient descent

## A higher learning rate

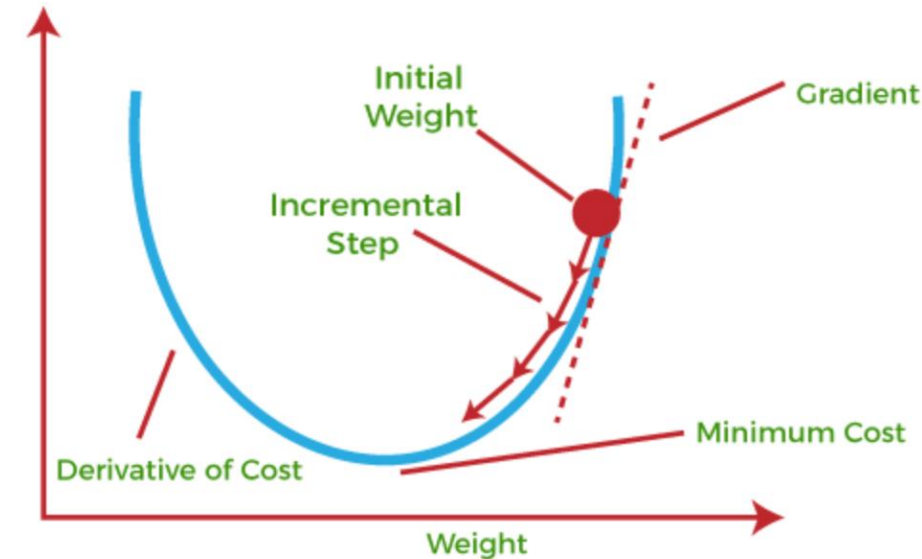
- Can lead to faster convergence
- But it may also cause the algorithm to overshoot the optimal solution.

## A lower learning rate

- May lead to slower convergence
- But may result in a more stable optimization process.

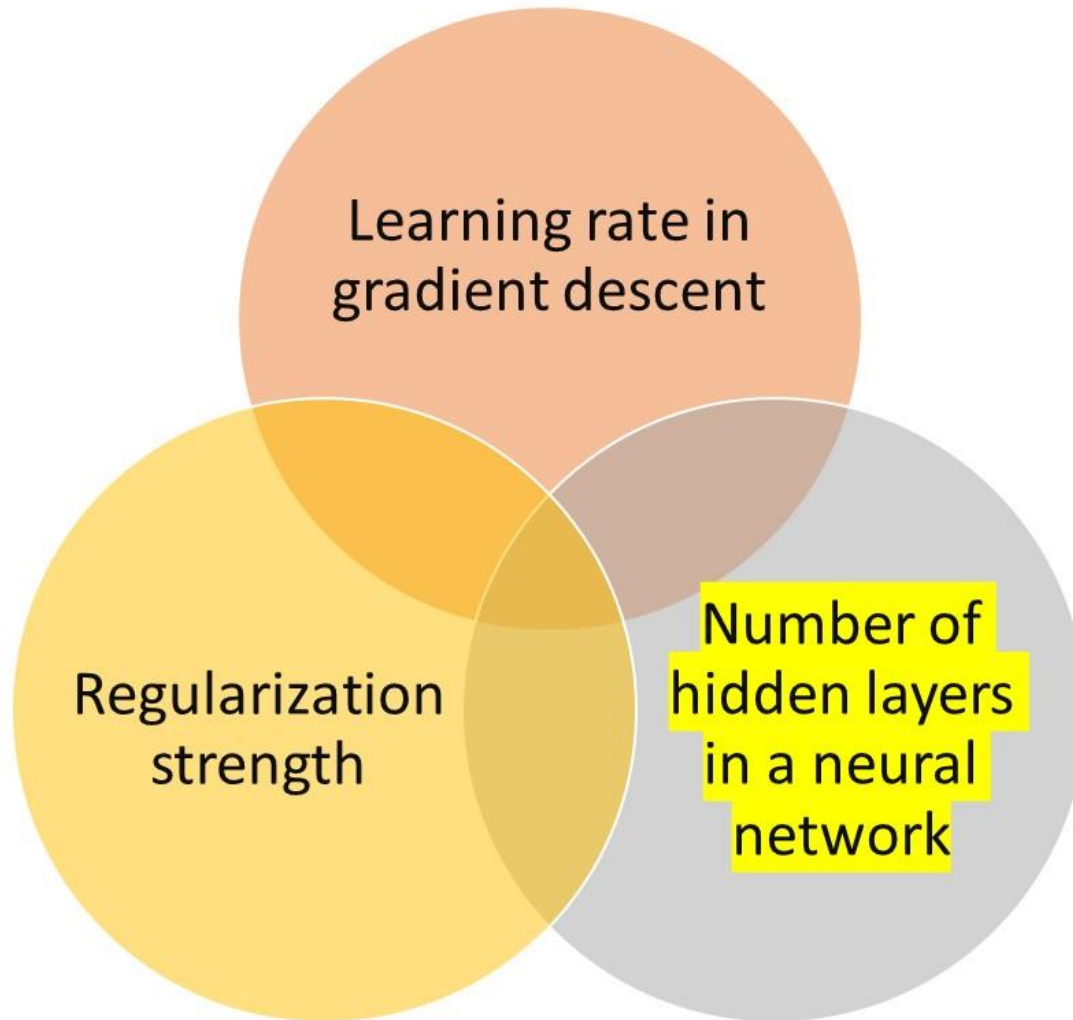
## Tuning the learning rate is crucial

- Optimizing the performance of gradient descent-based optimization algorithms



# What is next?

**What is number of hidden layers in a neural network**





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